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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,525	03/01/2002	Nabil M. Lawandy	910A.0022.U1(CS)	4091

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HARRINGTON & SMITH, LLP
4 RESEARCH DRIVE
SHELTON, CT 06484-6212

EXAMINER

SODERQUIST, ARLEN

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p style="text-align: center;">Office Action Summary</p>	<p>Application No.</p> <p>10/087,525</p>	<p>Applicant(s)</p> <p>LAWANDY ET AL.</p>	
	<p>Examiner</p> <p>Arlen Soderquist</p>	<p>Art Unit</p> <p>1743</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

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1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugarman (US 5,503,805) in view of Frankel (US 6,506,342) and Dean (US 4,978,616) or Anderson (US 5,186,824). In the patent Sugar man teaches apparatus and method for parallel coupling reactions that efficiently synthesizes diverse molecular products on substrates. In the apparatus a parent vessel (200) contains a suspension of substrates. The suspension is pressurized with argon and transferred to a plurality of reaction vessels (201-209) in one or more reaction vessel banks where monomer addition reactions take place. Optionally, the substrates may be tagged with a tag monomer. A vortexing motor (300) vortexes the contents of reaction vessels during monomer addition reactions to enhance synthesis. After the desired monomer and/or tag monomer addition reaction, the suspension is pressurized with argon and transferred back to parent vessel 200 for mixing. Thereafter, the suspension may be pressurized with argon and reallocated among reaction vessels for further synthesis. According to one embodiment of the invention, a parent vessel is used to mix bead suspensions. The mixed beads are distributed through a common manifold to a plurality of separate reaction vessels. In the reaction vessels, the beads are exposed to different, selected monomers, which react on the beads to be coupled thereto, preferably covalently. The beads may, optionally, be exposed to chemical "tags" which also couple, covalently or otherwise, to the beads. The beads are then recombined through the manifold back to the parent vessel and mixed. The mixed bead suspension is then again divided

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among the plurality of reaction vessels, and the process of monomer addition, bead mixing, and redistribution continues until the desired molecules are obtained. The process results in the formation of a collection of beads or other substrates with a diverse set of molecules formed on the surfaces thereof. A general description of the device is found in columns 4-6. column 10, lines 42-50 discuss the means to agitate the reactors. Figure 18 shows the set of commands that causes agitation (fluidization) in the parent vessel to mix the beads. Columns 22-24 discuss the transfer of beads between the various reactors and the parent vessel in addition to addition of reagents. Sugarman does not teach a reader station for identifying the beads as they are transported to the various reactors or specifically teach that the reactor is a fluidized reactor.

In the patent Frankel teaches tracking apparatus and method for use in a combinatorial synthesis process using a combinatorial chemistry bead that includes an electromagnetic spectral emitter that radiates a distinct electromagnetic code for each bead that uniquely identifies each bead, a terminal apparatus for receiving the electromagnetic code from each bead, and a method for performing combinatorial synthesis using a bead that transmits a distinct electromagnetic code. The invention includes a large number of spectrally narrowed light emitting mechanisms for generating distinct optical codes. Columns 2-5 discuss prior methods of tagging beads or supports used in chemical synthesis of a large number of diverse chemicals. Particularly relevant to the instant claims is column 3, lines 18-36, in which a chemical tag attached to or synthesized on the bead is explained. This approach is taught as suffering from the slow decoding process required to determine the identity of the synthesized molecule and/or lack of compatibility between the synthesis of the tag and the synthesis of the desired molecule. The figures and associated discussion of Frankel show the advantages of using a reader and the coding system and structures taught by Frankel.

In the patent Dean teaches a fluidized cell cultivation process and a fluidized bed reactor. Column 1 discusses fluidized bed reactors in general. Particularly, lines 42-47 teach that fluidized bed reactors provide a convenient way for conducting chemical processes that require mass and energy transport between a solid and a liquid or a gas with the advantage of high mass or energy transport rates. Lines 36 teach that in fluidized beds the fluid flow tends to redistribute itself toward a uniform velocity profile which is important to avoid channeling or other flow problems that prevent good contact between the solid and liquid phases. The Dean reactor uses

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an impellor to cause the fluid to flow through the bed of solid particles to fluidize or suspend them in the fluid.

In the patent Anderson teaches a system for solid phase reactions. The processor facilitates the precise control of the fluid flow and minimization of common flow problems. Column 3, lines 20-44 discuss the synthesis of oligonucleotides. The paragraph bridging columns 6-7 discusses the use of liquids having different densities as used in the synthesis. The paragraph bridging columns 8-9 teaches that instances occur when the solid phase support material is advantageously suspended to form a fluidized bed to promote one reaction of a series, and is then allowed to sediment and is treated as a column and a succession of reagents passed through it. This is the case with some procedures for oligonucleotide and peptide synthesis where the solid phase is suspended in a excess of synthon (e.g., activated amino acid or nucleotide) to promote coupling; but is then treated as a packed bed during other steps. The Anderson system is taught as adaptable to fill both of these functions. In this case the rotor is not completely filled with solid phase support initially. The rotor is operated with the axis horizontal, and by slow rotation, the solid support is completely and evenly suspended.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the label and detection/recording system of Frankel into the device and method of Sugarman because of the advantages taught by Frankel for the Frankel label relative to the chemical label of Sugarman. One of ordinary skill in the art at the time the invention was made would have either recognized that the vortexing of Sugarman constitutes a fluidized bed or found it obvious to replace the agitation means of Sugarman with means such as taught by Dean or Anderson for forming the bead suspension or fluidized bed because of their known equivalence and the recognized advantages of fluidized beds or particle suspensions as taught by Sugarman, Dean or Anderson.

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additionally cited art relates to labeling synthesis substrates and agitating particles during the synthesis process. It is noted that the cited Nova references could also have been used to provide teachings similar to the applied Frankel reference and the cited Zuckermann and Nokihara references could have been used to provide teachings similar to the applied Dean and Anderson references.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose current telephone number is (571) 272-1265 as a result of the examiner moving to the new USPTO location. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

A general phone number for the organization to which this application is assigned is (571) 272-1700. The fax phone number to file official papers for this application or proceeding is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



September 30, 2004

ARLEN SODERQUIST
PRIMARY EXAMINER